B E · Sem VII (R) 12 | 12 | Dec 14

I.T. DSIP

QP Code :15635

(3 Hours) **[Total Marks : 100**

N.B. (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** out of remaining **six** questions.
(3) Assume suitable **data** wherever required but **justify** them.

1. (a) Define Image enhancement and explain any three Point Processing Techniques. **10**
(b) Give the classification of discrete time signal with example. **10**

2. (a) Perform Histogram Equalization and draw the Histogram for the given grey levels of an image shown : **10**

Gray level	0	1	2	3	4	5	6	7
Frequency	123	78	281	417	639	1054	816	688

(b) Give the Classification of Discrete Time System with example. **10**

3. (a) List any five properties of 1-D DFT and explain the use of any two properties. **10**
(b) Explain smoothing and sharpening Filters with example. **10**

4. (a) For the following 4 × 4 image, determine its forward and inverse transforms and compare the inverse transforms with the digitized image data : **12**

$f(x, y) = [\,2\ 0\ 1\ 0\ ;\ 1\ 0\ 0\ 1\ ;\ 1\ 0\ 0\ 1\ ;\ 2\ 1\ 2\ 1\,]$

Use the following image Transforms :—
(i) Hadamard Transform
(ii) Discrete Cosine Transform.

(b) What is morphology ? Name and explain the basic four operations of morphology ? **8**

5. (a) Explain in brief different Lossless digital image compression technique. **10**
(b) If $x(n) = \{\,2, -1, 3, 0, 4\,\}$: **10**
Find :—
(i) $x(-n + 2)$
(ii) $x(n - 1)$
(iii) $x(2n)$
(iv) $x(n + 1)$

6. (a) Explain Hit-or-Miss Transformation. **10**
(b) Write a note on Hough Transform. **10**

7. Write short notes on the following :— **20**
(a) 4-point DIT-FFT
(b) Vehicle Number plate Detection and recognition
(c) Chain Code
(d) Homomorphic filter.

LM-Con.:11613-14.